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ABSTRACT

To help develop a curriculum program for technical writers, Cincinnati Technical College used the Developing a Curriculum (DACUM) method to produce a technical writing skills profile. DACUM develops an occupation analysis through a modified brainstorming process by a panel of expert workers under the direction of a qualified coordinator. This culminates in a graphic chart of the skills that workers must display to demonstrate competence. During a two-day workshop, the DACUM panel at Cincinnati Technical College identified 13 general areas of competency with 130 individual tasks. The first two areas of competency dealt with basic entry level skills: the ability to demonstrate technical expertise or aptitude and writing proficiency. The remaining 11 competencies included (1) planning the project, (2) coordinating the project, (3) researching the project, (4) organizing the information, (5) writing the project copy, (6) planning the illustrations, (7) conducting the project review, (8) producing the document, (9) performing administrative functions, (10) continuing professional growth, and (11) training and supervising employees. In addition to these competencies, the DACUM process generated three possible instructional methods for training the technical writer/editor: case study, role play/simulation, and internship. (HOD)

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# Analysis of the Technical Writing Profession through the DACUM Process

by
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## INTRODUCTION

Over the past several years, colleges and universities hoping to establish degree programs in technical writing faced a number of problems that they had to resolve individually if their efforts were to be successful. One of the more serious was the absence of published research information analyzing the technical writer's profession or defining entry level skills. Another problem was that a number of states, Ohio included, had no guidelines to determine at what level technical writing programs should fit into higher education or to evaluate the quality of proposals state institutions were submitting for approval to begin their own degree programs.

The method we used to solve these problems at Cincinnati Technical College was to have a group of technical writers analyze their jobs. In order for the analysis to be successful, these professionals would have to represent a wide range of companies and organizations because students entering such a program would major in a number of areas and work for employers who specialize in a variety of fields. While providing a valuable service to the educational community, these individuals would also be contributing to the growth of their profession as well as their own professional growth. For the analysis of the technical writing profession, we chose the DACUM Process.

## DEFINITION OF DACUM

DACUM is an acronym that means Developing A CurriculUM. Basically DACUM consists of an analysis of an occupation developed through a modified brainstorming process by a panel of expert workers from that occupation under the direction of a qualified coordinator. The DACUM process produces a single-sheet skills-profile of an occupation which is called a DACUM chart. This occupational profile serves as a tool for curriculum development and program evaluation. The chart presents systematically an entire occupation in terms of skills that workers must display to achieve competence.

The DACUM process is a type of "task analysis" approach in a systematic model of curriculum development. Although many models have been adapted from this process, especially in Canada, it is distinguished from other methods of program development and evaluation by two definite characteristics. First, a panel of experts from the occupation analyzes their jobs in a systematic approach; and second, the result of their analysis is produced in a graphic chart to be used for various educational and training purposes.

## DACUM WORKSHOP ASSUMPTIONS

Three assumptions provide the foundation for an educational philosophy that stresses the importance of occupational task analysis by the actual practitioners.

1. Any job can be described in terms of the actual tasks that a worker performs.

2. These described tasks have implied knowledge and attitudes that workers must possess to perform the tasks accurately and successfully.

3. In any occupation, expert workers are the most capable persons to describe their own jobs in terms of skills and tasks.

## PANEL SELECTION

The success of a DACUM workshop centers upon a panel that represents the service area/community; therefore, the logical starting point for identifying such persons was the Cincinnati-Dayton Chapter of the Society for Technical Communication. From a membership roster, the chapter president identified a number of technical writers from Southwestern Ohio who were committed to excellence in their profession and would be qualified for such an undertaking. From that list, nine volunteered to serve on the DACUM panel to describe their jobs. The criteria for panel membership are listed in the table.

Table 1 Criteria for Panel Membership

| Company Size* | Type of Industry | Special Factors |
|---|---|---|
| Small | Computer | Private Small Business |
| Medium | Electronics | Large Corporation |
| Large | Manufacturing | Local Business |
| | Publications | Federal Contracts |
| | | Graphics Specialist |
| | | Technical Specialist |
| | | Award Winner |

*Small=fewer than 100 employees
Medium=100 to 500 employees
Large=more than 500 employees

The panel itself included the following people:

Mark D. Albert, Associate Editor, Modern Machine Shop magazine, Cincinnati, Ohio

Norma E. Allen, Editor, Reports and Proposals, General Electric Company, Cincinnati, Ohio

Amy Brewer, Technical Writer/Editor, Belcan Corporation, Cincinnati, Ohio

L.P. "Luigi" Espenlaub, Technical Writer, Reynolds and Reynolds, Cincinnati, Ohio

Anne C. Hamilton, Writer/Editor, Word Service, Cincinnati, Ohio

Ralph E. Hoehn, Data Manager, Technical Service, Cincinnati Electronics Corporation, Cincinnati, Ohio

Thomas R. Milligan, Manager, Technical Writing Department, O'Neil and Associates, Inc., Dayton, Ohio

Terri Parker, Technical Writer, Cincom Systems, Inc., Cincinnati, Ohio

Jim Quinlivan, Technical Writer, NuTone Division of Scovill, Cincinnati, Ohio

## THE WORKSHOP PLANNING PHASE

During the discussion of arrangements with prospective panel members, three participants stated their belief that the technical writing occupation is impossible to analyze because of the nature of the occupation. First, different companies produce unique products that significantly influence the kind of technical writing required. In addition, size of the company also determines a vast range of job responsibilities for a technical writer. Ironically, the smaller the company, the more tasks and responsibilities are required of the technical writer. Finally, the background and training of technical writers are so extremely varied that consensus on tasks would be impossible because of a basic philosophical dichotomy. Namely, is a technical writer a writer turned technician or a technician turned writer? The infamous chicken/egg controversy typifies the dilemma when writing for a technical world.

## DACUM WORKSHOP

The Technical Writer/Editor Workshop ran for thirteen hours over two days on May 19 and 20, 1983. During the two days, the panel identified 13 general areas of competency with 130 individual tasks. Initially 20 general areas and over 200 tasks were developed through the intense brainstorming sessions. Revision, which the process naturally evokes, condensed the job description. The general areas of competance are listed in the following table.

Table 2 General Areas of Competence

| | |
|---|---|
| Entry Level Skills | a. Demonstrate Technical Expertise or Aptitude<br>b. Demonstrate Proficiency in Composition |
| A. | Plan the Project |
| B. | Coordinate the project |
| C. | Research the Project |
| D. | Organize the Information |
| E. | Write the Project Copy |
| F. | Plan the Illustrations |
| G. | Conduct Project Review |
| H. | Produce the Document |
| I. | Perform Administrative Functions |
| J. | Continue Professional Growth |
| K. | Train and Supervise Employees |

## OCCUPATION DEFINED

The panel decided upon the term "Technical Writer/Editor" to capture the scope of the occupation. The experts looked at numerous labels (such as technical communicator) but reached consensus on writer/editor. This phase occupied over an hour of discussion while panel members shared information about their occupation, companies, and specific departmental situations. Some viewed themselves as translators for an audience, others as editors of technical drafts, and another as a provider of support service to an engineering department. The panel agreed that they all produced documents and

materials which were instructional or informational in nature. Their overriding consensus focused on the commitment of the occupation to serve a specific audience. They concluded that "the technical writer/editor produces documents and materials to instruct or inform specific audiences."

ENTRY LEVEL SKILLS

The panel members ran into a conflict among themselves when they began listing the skills required to produce the project copy. Several members believed that this area should identify only those skills associated with the process of physically producing the project copy (i.e. selecting and using various tools and equipment to the submission of the draft). Others, however, felt that this section should include the communication skills necessary to actually write the copy. The panel debated this issue for about 45 minutes before it concluded that communication skills were a prerequisite for the other skills in this area and that anyone seeking employment as a technical writer would have to demonstrate proficiency in composition before he or she could be hired. The panel then decided that if the completed DACUM chart was to give an accurate picture of the skills a competent technical writer needs, it should include entry level skills. At this point, one panel member identified about 25 separate points that he thought related to composition. The other panel members, however, recognized that such a number would be unwieldly on the finished chart and condensed the number to 7 by placing a number of the skills in the tasks "using sentences and paragraphs effectively" and "striving for unity, coherence and emphasis."

With this issue resolved, the panel then concluded that a person entering their profession would also have to show expertise in a technical area. They agreed that this area of competence was significant because technical writers must frequently communicate with engineers and technicians to gather data or familiarize themelves with a concept, product, or process they will be writing about after their research is completed.

MANAGING THE PROJECT

The technical writer/editor solves problems as a project manager. Thirteen performance standards describe the planning sequence of the technical writing project.

Plan the Project

One significant insight was clarified by the panel. The technical writer does not determine the purpose of the project as a separate task. Interestingly, the technical writer/editor defines the audience, not the purpose because purpose is audience. The experts are so intensely audience-committed that purpose becomes a subset in many tasks. Teachers of technical writing stress purpose as a separate entity in the writing process. But the panel of experts do not perceive their profession as making that didactic distinction. Their entire "purpose" is to satisfy the audience's need.

Coordinate and Research the Project

This general area of competence requires a technical writer/editor to interact with numerous groups and individuals. Communication is achieved not only through the finished written product but even more by interaction with different people. The technical writer/editor interacts with many different people in different settings such as meetings and interviews. The broader definition of communication skills is truly descriptive of a technical writer/editor's role. The job description of the technical writer/editor dispels the stereotype of the solitary writer quietly composing the draft. The technical writer/editor must work with production staff, photographers, illustrators, artists, printers, engineers, technicians, management, and most importantly with the client/audience. This dynamic communication process eventually results in a product called the final draft, but what a complex system!

PRODUCT DEVELOPMENT

The technical writer/editor also undertakes the writing process. General areas of competence include "organizing the information," "writing the project copy," "planning the illustrations," and "producing the document."

Organize the Information

The only time purpose entered into the discussion of the job description was as a method to help organize information. Outlining the draft was stressed, but the focus was again on the larger scale. Since outlines are not developed in isolation, the technical writer/editor must interact with many people before a draft is developed. Even during the writing process, feedback to and from designers helps edit and reorganize the format.

Write the Project Copy

The importance of the audience to the technical writer/editor was emphasized even during the tasks of writing the project copy. Standardized terms, acronyms, vocabulary, and illustrations were evaluated for readability in this stage. External controls shaped the draft because the panel stressed the role of compliance with standards and specifications from numerous sources. The effects of the draft had to be analyzed from these different points of view which ranged from immediate supervisors to the federal government.

Plan the Illustrations

The distinctive nature of technical writing is highlighted by the twelve stages that the technical writer/editor completes to plan the illustrations. The panel sequenced the twelve tasks to develop illustrations that are essential for this type of writing. The panel did not focus on the kinds of figures but how they assess the draft for appropriate illustrations. Although their tasks determine requirements, kind, color, and style of illustrations, the interaction with artists and technical sources actually evaluates and approves the

final illustration. In certain companies, the technical writer/editor may even have to draw the illustrations.

Produce the Document

Nowhere are detailed, special skills more evident than in the production of the document. The panel clearly assessed the fifteen competencies that the technical writer/editor performs in this general area. Obviously, the "editor" dominates during this stage as proofreading, camera-ready copy, and photographic skills are demonstrated. The required skills range from "paginate the text" to "solve production problems." Keen powers of observation and expertise in both printing and photography are needed for production of the document.

Conduct Project Review

The evaluation of all the former areas, including the draft, is conducted in the project review. Perhaps this general area tests the competencies of the technical writer/editor more than any other. The project review demands synthesis of all composition and people skills for the technical writer/editor. Communication skills are weaved into group dynamics during this phase. These eleven competencies could be flowcharted to heighten the role of revision, corrections, and changes. The panel kept repeating the concept of the "loop." A technical writer/editor keeps the review cycle operating until final approval is achieved. These tasks are so critical that the table lists them.

Table 3 Tasks to Conduct Project Review

1. Conduct meetings
2. Listen to comments
3. Advocate your position
4. Resolve conflicts
5. Incorporate comments
6. Evaluate the impact of changes
7. Correct the copy
8. Verify for accuracy and adequacy
9. Prove the quality of the material
10. Resubmit for review
11. Continue review cycle until final approval

LOOP

IMPLICATIONS FOR INSTRUCTION

The college teacher of technical writing must realise the distinction between training technicians to write technically and educating students to be technical writers. Ideally the results of this DACUM process should be useful to re-think and design the technical writing courses in higher education. Instructors should strive to educate students in technical and engineering programs to communicate with technical writers/editors, not to become them. A separate curriculum must be planned for the education of technical writers/editors.

Technical Writing Courses

Direct implications for instruction of technical writing courses center on the broader definition of communication skills. Perhaps

courses that teach only types of writing, such as descriptions of mechanisms or unsolicited proposals, must be expanded to include formal presentations, discussion techniques, and organizational development. Technicians and engineers need to communicate with the technical writer/editor so that the final document bridges the gap between their thinking and the audience's needs. The technical writer/editor is the facilitator of this process.

## Technical Writer/Editor Curriculum

The DACUM chart, which identifies 130 competencies of the technical writer/editor occupation, should form the basis for a competency based curriculum. The program would assume and test entry level skills of applicants for both technical expertise and proficiency in composition. The curriculum might have to be offered during the last part of a degree program or after its successful completion. But the timing is not as important as methods. The technical writer/editor curriculum must address the development of competencies in project management and product development. Three appropriate instructional methodologies would be the case study, role-play/simulation, and internship.

## The Case Study Method

A case is a narrative fiction that will force students to think and behave as a technical writer/editor in order to solve various communication problems presented within it. An effectively designed case will mirror the conditions students will encounter in the real world of the technical writer/editor, contain all the information necessary to produce the final written document(s), and stress the concept of problem solving as related to the broader definition of communication. Also, it will have to incorporate many of the competencies and skills recognized in the DACUM chart, such as planning and coordinating projects, researching and organizing information, and writing the project copy. Cases will also allow the student to assume the part of the central character in the narrative who will interact with others, identify audiences, and develop the communication in terms of that particular audience's needs. For those instructors who write their own cases, the DACUM chart can serve as a guide for including the specific tasks relative to the profession and for undertanding the overall process a technical writer/editor must successfully complete to produce a document.

## Role-Play/Simulation

Since the technical writer/editor is a project manager who interacts with many sources of information, structured experiences that assimilate real world working conditions could be constructed. Simulation of the environment would stress the essential human interactions and delicate problem centering and solving processes. People and task orientations could be synthesized to create a climate to develop competencies as a technical writer/editor. In-basket exercises could provide a practicum in a college classroom that could attempt to measure the competencies of the technical writer/editor.

Role playing could give valuable insight and feedback to the student technical writers/editors because they could act out company

and client roles as well as their occupational choice. To see the occupation from another person's point of view offers an invaluable perception into the limitations of the tasks of the technical writer/editor. The students will appreciate the responsibilities of the printers, photographers, designers, and artists if they could role play accurately and authentically these occupations which support and assist the technical writer/editor in the daily performance of his or her job.

Internships

Probably the greatest method for developing competencies is the internship. As a matter of fact, the case study, role playing and simulation could prepare the student for the clinical internship. Cooperative education could provide the structure for a vital and relevant educational experience in the technical writer/editor profession. Actual "hands-on experience" with direct supervision from a practicing professional could begin the internship. Gradually, the student technical writer/editor could be indirectly supervised while being given more responsibilities for project management and product development. The panel stated that many of their departments were understaffed and overworked, especially at deadline. Perhaps the internship problem could assist them while it taught the student.

SUMMARY

The Technical Writer/Editor DACUM Workshop identified 130 different tasks that analyze the occupation in a job description format. The DACUM chart could generate a competency-based curriculum for the formal education of people who want to become technical writers/editors. The two basic concerns of the occupation center upon project management and project development. The technical writer/editor interacts with many sources and audiences to create informational/instructional documents. This dynamic occupation requires as entry levels both proficiency in composition and technical expertise, or at least aptitude. Three instructional methods in a separate curriculum to educate technical writers/editors are implied by the chart. The case study, role play/simulation, and internship provide ideal situations with minimum constraints to prepare students for the world of work as a technical writer/editor.

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You may obtain a copy of the DACUM chart for the Technical Writer/Editor by contacting the authors directly.